



REMARKS

Applicants submit this amendment in response to the Office Action dated October 7, 2005, in which the Examiner rejected the claims on the basis of prior art. Specifically, the Examiner rejected claims 1-15 under 35 U.S.C. §102(b) as being anticipated by the Smith patent (US6309471), or in the alternative by the Motson published patent application (US20030148905), or in the alternative by the Bakos patent (US4276186).

In response, applicants have cancelled claims 1-6 (all of the composition-of-matter claims), as well as dependent method claim 10, and the limitations of the latter relating to the specific ingredients of the formulation and the compositional ranges thereof have been incorporated into independent method claim 7, with one still further narrowing exception: in the recitation of the first component of the composition, the term "amine" (as it read in claim 10) has been replaced by the narrower term "hydroxylamine" (as it now reads in amended claim 7). Applicants respectfully traverse the statutory grounds for rejection, since applicants earnestly believe that the claims, as now amended hereinabove, are not anticipated by any of the prior art references upon which the Examiner relies, and that they recite patentable subject matter in a fashion which is distinguishable over the cited prior art.

The claim rejections entered by the Examiner seem to emphasize a basic fact of life in the cleaning or pretreatment formulation art, namely, that any such formulation is defined by the specific selection and combination of ingredients or functional components, as well as by the manner in which the formulation is applied. This is consistent with the manner in which inventive cleaning or pretreatment formulations are developed in this art. First, a set of desired properties for the intended application is defined. Then, the challenge is to select the specific combination of components, and the compositional range for each component, that will yield those desired properties. When the formulation disclosed and claimed by applicants is evaluated against this technical backdrop, it will be seen that the amended claims are novel over the prior art upon which the Examiner relies.

Turning first to the Smith patent, this reference discloses that a cleaning or pretreatment composition may comprise a hydroxide compound, such as an alkali metal hydroxide, and/or a hydroxylamine compound, such as an alkanolamine, as the Examiner has pointed out. However, the Smith reference does not specifically teach the inclusion of *both* a hydroxide salt *and* a hydroxylamine compound in the formulation, nor does it suggest the synergistic effect that results from the interaction of these two ingredients.

The brown oxide pretreatment composition used in the present invention, on the other hand, comprises *both* a hydroxide compound *and* a hydroxylamine compound as essential components; the use of both of these compounds *together* results in the unwinding of the polyimide rings so that the polyimide takes on a linear molecular configuration, allowing the formation thereafter of secondary chemical bonds between the linear polyimide molecules and a B step adhesive sheet under conditions of high pressure and high temperature; it is these secondary chemical bonds that are responsible for the excellent adhesion of the polyimide film that can be attained, as disclosed by applicants on page 6 of the specification, lines 9-17. Applicants respectfully invite the Examiner's attention to the fact that the Smith reference can employ either *only* an alkali metal hydroxide or *only* a hydroxylamine, to enable the pH of a solution of salicylic acid to be adjusted to fall within the preferred range (see Example 2 of Smith).

Moreover, the Smith reference fails to teach or suggest the claimed method of improving the adhesion of a polyimide surface by treating *a printed circuit board* with the brown oxide pretreatment composition, as recited in amended claim 7. Rather, Smith focuses on a method of removing stains caused by iodine, which is used in antiseptics and disinfectants to prevent the growth of micro-organisms and in controlling the spread of disease, and Smith's cleaning composition would therefore more likely be used in medical or health care facilities, or in institutional and industrial facilities and the like

(see column 1, lines 4-18 of the Smith reference), rather than being applied to the surfaces of electronic components, especially printed circuit boards. Applicants therefore contend that Smith is inapposite and is not anticipatory.

As to the Motson reference, it discloses methods of hard surface cleaning, using aromatic esters as useful solvents, for domestic, institutional and industrial applications, such as de-greasing (particularly metal de-greasing), vehicle cleaning and paint removal (including paint stripping and graffiti removal), as well as cleaning compositions suitable for use in such methods. Motson teaches that besides the solvent, his cleaning formulations may also include non-solvent components such as surfactants and even non-surfactant materials (see paragraphs 36-53 of Motson); for the latter he suggests that hydrotropes, builder materials, sequestrants, alkalis such as sodium hydroxide or triethanolamine, acids, solids, corrosion inhibitors, and anti-foaming agents be included (see paragraphs 44-53 in particular).

However, Motson's disclosure clearly treats these non-surfactant materials, and indeed, all of the non-solvent components, as optional (rather than essential) ingredients of his cleaning composition. In other words, the use of these materials is not suggested by Motson for their ability to act as cleaning agents in their own right, which Motson neither recognizes nor appreciates. Rather, Motson suggests that an alkali such as sodium hydroxide or triethanolamine can be included in his composition

simply to maintain an alkaline environment so as to aid in the ancillary removal of fatty compounds through saponification (see paragraph 48 of Motson). On the other hand, in the present invention the hydroxide compound and the hydroxylamine are employed not only as *essential* ingredients, but in a specific compositional ratio of each component to the whole, and the improvement in the adhesion of a polyimide surface which characterizes applicants' invention can be attained only by using that particular combination of essential ingredients in that ratio. Motson fails to disclose that the hydroxide and hydroxylamine ingredients are essential (rather than ancillary) components, as now recited herein in amended claim 7, and applicants therefore believe that Motson is not an anticipatory reference.

With regard to the Bakos patent, this reference is directed to a cleaning composition which is especially suited for removing solder flux and its residue from a substrate, particularly during the manufacture of integrated circuit modules. Bakos also discloses a cleaning composition suitable for removing various cured synthetic organic polymer compositions from a substrate, and especially for removing the top seal of an integrated circuit chip module, such as a cured polyimide coating composition (see column 1, lines 6-15, and column 4, line 61, though column 5, line 13, of the Bakos patent). According to Bakos, the presence of the alkanolamine enhances the solvent action of the composition, and makes it possible to remove stains or residue from solder flux which is not removable to any significant extent by methyl pyrrolidone alone (see

column 3, lines 43-58).

However, applicants contend that the Bakos reference is irrelevant to the composition described in the present invention, and to the method of using that composition, as recited in amended claim 7, as a pretreatment in a brown oxide process for innerlayer circuits during the fabrication of flexible printed circuit boards (FPCBs) and multilayer printed circuit boards (MLBs), in order to clean a copper surface and to improve the adhesion of a polyimide surface, as clearly disclosed by applicants on page 5 of the present specification, lines 19-24.

One of ordinary skill in this art will readily recognize that the amide and polyimide components used in a solder mask composition (*i.e.*, a top seal composition) differ quite significantly in overall features, including physical and chemical properties, from the polyimide substrate used in FPCBs and MLBs. Furthermore, the cleaning composition of the Bakos reference serves to *remove* a cured polyimide coating, which is completely different from the function of the composition described in the present invention. Although Bakos teaches the optional use of alkali metal-based or alkaline earth metal-based materials (such as hydroxides *other than* alkanolamines) in order to remove cured polyimide coatings, the compositional ratios of the alkanolamine and the hydroxide compound disclosed in Bakos (see the experimental Examples in that reference) are outside the compositional ranges of the present invention. Thus,

applicants believe that nothing in the Bakos reference anticipates applicants' invention as presently claimed.

Applicants submit that no new matter has been introduced by virtue of the foregoing amendments to the claims, and that no additional filing fees are required by virtue of the claim amendments. Nevertheless, the Commissioner is authorized to charge any additional fees which may be required, or to credit any overpayment, to Deposit Account No. 07-1730. A duplicate copy of this paper is enclosed for that purpose.

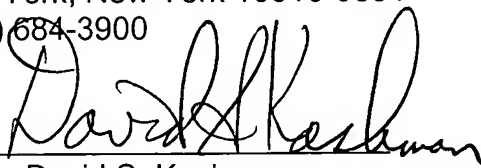
Furthermore, the Commissioner is requested to construe this paper as including a retroactive petition for a one-month extension of time in which to file a response to the outstanding Office Action, and accordingly, a check for the official fee of \$120.00, as prescribed therefor by 37 C.F.R. §1.17(a)(1), as amended, in the case of a non-small entity, is also submitted herewith. The Commissioner again is authorized to charge any additional extension fees which may be required, or to credit any overpayment, to Deposit Account No. 07-1730.

Applicants have responded herein to each of the points raised by the Examiner in the Office Action, and applicants have amended the claims in an earnest effort to place this application in condition for allowance. Applicants have explained why they believe

that all of the pending claims, as presently amended, are patentable over the cited prior art. Accordingly, further favorable action in connection with this patent application is earnestly solicited. The Examiner is invited to contact the undersigned attorney by telephone if it will advance the prosecution of this case.

Respectfully submitted,

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Date of Deposit January 27, 2006

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